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Carney Hospital
Description of Injury Discharges

Massachusetts Department of Public Health
Statewide Comprehensive Injury Prevention Program

June 1991

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CARNEY HOSPITAL
DESCRIPTION OF INJURY DISCHARGES

Statewide Comprehensive Injury Prevention Program
Bureau of Parent, Child and Adolescent Health
Massachusetts Department of Public Health
150 Tremont Street, Boston, MA 02111

June 1991

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Introduction

Injuries, both unintentional and intentional, are a leading public health problem in Massachusetts and in the other 49 states. More young people die from injuries than from any other cause, and older people are hospitalized for injuries at the highest rate of any age group. Most injuries can be prevented or reduced in severity through strategies that combine education, regulation, and technology.

This report on injury discharges from Carney Hospital is the second in a series developed by the Statewide Comprehensive Injury Prevention Program with funding received from the Office of Disability Prevention. The purpose of the series is to show how hospital discharge data can be used to identify and describe injury problems in different communities.

The primary goal of the Statewide Comprehensive Injury Prevention Program (SCIPP) is the reduction of injuries among Massachusetts citizens. This goal is met through the development of methods to improve existing data sources, the development of strategies and training materials to help integrate injury prevention into ongoing public health services, the coordination of injury prevention efforts, the dissemination of information, and research into the causes of injuries. The Office of Disability Prevention (ODP) is also involved in planning injury prevention programs.

Accurate and comprehensive data about injuries are needed to develop and improve preventive strategies, to target high-risk groups, and to evaluate the effectiveness of injury prevention methods. In Massachusetts, for every injury death in 1988 there were about 19 injuries serious enough to warrant hospital admission. The Uniform Hospital Discharge Data Set (UHDDS) compiled by the Massachusetts Rate Setting Commission is an important source of demographic, clinical, and financial data about injured people who have required admission to acute care hospitals. Hospital discharge data include many fatal and most serious nonfatal injuries and provide a broader picture of injuries than death data alone. However, a crucial item, the external cause of injury code (E code) which describes how the injury occurred, is not required for reimbursement, and only a minority of discharge records are E-coded.

Carney Hospital has been diligent in coding the external cause of injury for most of its discharges included in the most recently available discharge data bases. Therefore, we have selected its discharges for further analysis to demonstrate the value of external cause coding. The focus of the report will be on the three leading causes of injuries (falls, self-inflicted, and assault-related injuries) for people admitted to Carney Hospital from October 1986 through September 1988.

Carney Hospital

Carney Hospital is a 344-bed general hospital located in the South Dorchester section of Boston, Massachusetts and is accredited by the Joint Commission on Accreditation of Health Care Organizations. It is one of several hospitals serving

Dorchester residents. Some residents with serious injuries are admitted to other Boston hospitals that are designated as trauma centers.

In 1980, South Dorchester had a population of 61,572 composed of 54.0% females and 46.0% males. Almost half (48.4%) of South Dorchester residents were Black as compared to 3.9% statewide. South Dorchester included somewhat more residents 0-19 years old and somewhat fewer residents over the age of 44 years than the overall state population.

External Cause of Injury Coding

E codes are the external cause of injury codes (E800-999) developed as part of the International Classification of Diseases (ICD-9-CM)[1] (Appendix A). They are used primarily in conjunction with ICD-9-CM codes 800-999[2] that describe the clinical nature of the injury and body part affected (Appendix B). E codes classify the environmental events, circumstances, intent, and conditions that cause injury, poisoning, and other adverse effects, (e.g., fall on same level from slipping, tripping, or stumbling). Secondary E codes are useful in identifying the place of occurrence of an injury, (e.g., home), or reason for primary cause, (e.g., adverse drug reaction precipitating a fall).

Together, analysis of both diagnosis codes and E codes can tell us a great deal about how, when, where, and why people get injured. Some of the questions that can be answered include:

Who is injured?
How are these people injured?
Where do these injuries take place?
How many of the injuries have occurred, and over what period of time?
How do local injury rates compare with the national and state rates?

"E-coded hospital discharge data (HDD) systems are potentially one of the most practical and cost-effective means available to collect the data needed to prevent and control injuries. The addition of E codes to HDD systems increases their practical utility to address a major public health problem and obviates the need to establish new data collection systems."[3]

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[1] International Classification of Diseases, 9th Revision, Clinical Modification. Ann Arbor, MI: Commission on Professional and Hospital Activities, 1986.

[2] The following codes are excluded from the analysis of injuries: late effects (905-909), complications of care (996-999), and codes below 800.

[3] Sniezek J, Finklea J, Graitcer P. Injury coding and hospital discharge data. JAMA 1989; 262:2272.

Data Set

A data set was created by combining all discharges from Carney Hospital during FY 1987 and FY 1988 (October 1, 1986 to September 30, 1988) submitted to the Rate Setting Commission. The data set was created to describe the hospital's inpatient injury caseload with emphasis on the leading causes of injury based on the demographic, clinical, and financial information available in the UHDDS. It does not include records of people who died without being admitted nor does it include data on deaths or continued cost of care after discharge. It does include readmissions for additional treatment of a previous injury.

The primary focus is the 1,548 E-coded injury discharges with ICD-9-CM codes in the 800-904 and 910-995 ranges. These injuries accounted for 6.9% of the 22,291 total discharges, 6.5% of the $147,644,686 in hospital charges, and 6.4% of the 205,406 hospital days. Injuries potentially could account for substantially higher proportions of discharges, charges, and days if non-E-coded injury discharges, injury diagnoses that are secondary, and E-coded discharges with principal diagnoses below 800 were included in this analysis.

In the analysis that follows, comparisons of length of stay and total charges will use median values that represent the middle value of each distribution, above and below which lie an equal number of values. Because of the presence of some extreme values that skew the distributions, comparisons using mean values are less appropriate.

Table 1
Discharge Data for Carney Hospital (October 1, 1986 to September 30, 1988)

Discharges	#	%	Charges ($)	%	Days	%
Injuries*	1,809	8.1	12,261,778	8.3	17,088	8.3
E Code	**1,548**	**6.9**	**9,642,570**	**6.5**	**13,223**	**6.4**
No E Code	261	1.2	2,619,208	1.8	3,865	1.9
Other**	19,993	89.7	130,908,946	88.7	183,096	89.1
Total*	22,291	100.0	147,644,686	100.0	205,406	100.0

* Principal diagnoses of late effects (905-909) and complications of care (996-999) are excluded from injuries (800-999) but included in total discharges.

** Principal diagnoses below 800.

Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.

Overview of Injury[4] and Other[5] Discharges

- Discharges of people admitted with injuries represented 8.1% of all discharges (1,809).
- Injuries accounted for $12,261,778 in charges or 8.3% of all hospital charges.
- The median charge for injury discharges was $3,217 as compared to $3,874 for other discharges.
- Injuries accounted for 17,088 days of care or 8.3% of all hospital days.
- The median length of stay for injury discharges was four days as compared to five days for other discharges.
- Among injury discharges, 6.5% incurred charges of $20,000 or more as compared to 4.8% of other discharges.
- Medicare and Medicaid were the principal sources of payment for more than a third of injury (26.4%, 11.4%) and almost half of other discharges (37.8%, 10.6%). More than a quarter (26.4%) of injured patients paid for their own hospital care as compared to 11.6% of patients hospitalized for other reasons.

[4] Codes 800-904 and 910-995 with and without E codes.

[5] Codes below 800.

Description of Injury Discharges by External Cause of Injury

More than four-fifths (85.6%) of injury discharge records (1,548) included the external cause of injury (E code). Two-fifths of E-coded injuries were fall-related, almost a quarter were intentional[6], and an eighth were vehicle-related[7]. Discharges for the three most frequent external causes of injury will be described in detail.

Table 2
External Cause of Injury for Discharges from Carney Hospital

Cause	Total #	Total %	# Female	# Male
Falls	636	41.1	393	243
Self-inflicted	179	11.6	99	80
Assault-related	169	10.9	29	140
Poisoning	131	8.5	54	77
Motor-vehicle occupant	88	5.7	39	49
Motor-vehicle/pedestrian	48	3.1	18	30
Struck by object	37	2.4	10	27
Overexertion	30	1.9	17	13
Cutting/piercing	28	1.8	3	25
Adverse drug reaction	23	1.5	13	10
Pedal cycle	21	1.4	7	14
Other transportation	21	1.4	7	14
Environmental/radiation	20	1.3	12	8
Motorcycle	16	1.0	2	14
All other causes	101	6.5	32	69
All E-coded causes	**1,548**	**100.0**	**735**	**813**

Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.
Note: Percents do not total 100.0 due to rounding.

[6] Includes self-inflicted and assault-related injuries.

[7] Includes motor-vehicle occupant, pedestrian, other transportation, pedal cycle, motorcycle, and off-road motor-vehicle injuries.

Falls

Falls were the leading cause of injury hospitalization, accounting for 636 admissions during the study period.

- Falls accounted for two-fifths (41.1%) of E-coded injury discharges. Falls are the leading cause of injury-related hospital admissions in the United States and in Massachusetts, representing an estimated one-third of discharges for nonfatal injuries.

- More than half (55.7%) of fall-related discharges involved people 65 years old and older. In general, the elderly are at highest risk of both dying and being hospitalized as the result of a fall as compared to younger people who experience falls (Figure 1).

- Almost a third (31.9%) of fall-related injury discharges among the elderly involved people 85 years old and older.

- Falls accounted for the largest proportion of discharges within three age groups (Table 3): 0-14 (44.2%), 45-64 (44.3%) and 65+ (78.1%).

- Within each age group under the age of 45, more males than females were admitted due to a fall; over the age of 44, more females than males were admitted, especially in the 65+ group.

- Most (84.9%) patients admitted for fall-related injuries were White.

- Patients admitted for fall-related injuries resided in a wider radius of the hospital than those admitted for assault-related or self-inflicted injuries.

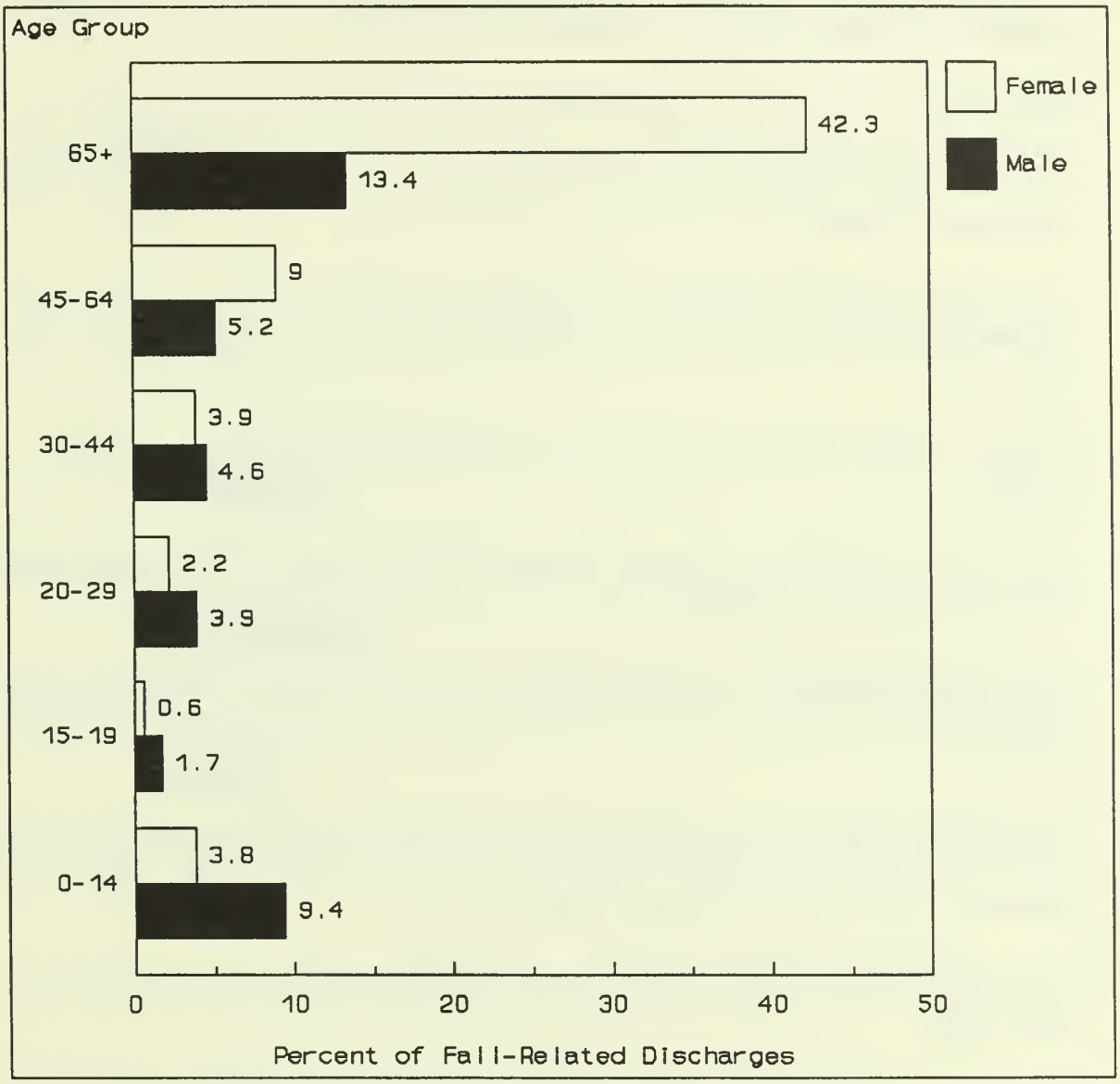
- The median charge for a fall-related discharge was $6,138 as compared to $3,285 for all causes of injury. However, the average daily charge ($703) was somewhat lower than for all other injury causes ($772).

- The median length of stay was eight days in contrast to four days for all causes of injury.

- Thirteen of the 21 deaths included in the injury data set occurred among people hospitalized for fall-related injuries.

- Most fall-related injuries resulted in fractures of various body parts: femur (35.4%),lower limb (18.6%), upper limb (13.1%), neck/trunk - no spinal cord injury (12.9%), and facial (1.3%).

Figure 1
Distribution of Fall-related Injury Discharges from Carney Hospital by Age Group and Sex



Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.

Note: Number of fall-related injury discharges (total=636, female=393, male=243).

Self-inflicted Injuries

Self-inflicted injuries were the second leading cause of injury hospitalization, accounting for 179 admissions during the study period.

- Approximately 12 percent of E-coded injury discharges were the result of self-inflicted injuries. Among a selected group of acute care hospitals in Massachusetts[8], self-inflicted injuries were the fourth leading cause of injury-related hospitalizations, accounting for 8.5% of nonfatal, E-coded discharges in FY 1985. Because intent can be difficult to determine, the proportion of these injuries is probably higher than indicated by E codes.

- More than a third (37.4%) of self-inflicted injuries involved people between 20 and 29 years of age; the second most common age group was people between 30 and 44 years old, accounting for a quarter (25.1%); a sixth (16.8%) involved adolescents (Figure 2).

- Self-inflicted injuries accounted for the largest proportion of injury discharges for adolescents (26.1%) and the second largest proportion for young adults (21.1%) (Table 3).

- Females predominated in two age groups, children (0-14) and young adults (20-29).

- More than half (55.9%) of patients admitted for self-inflicted injuries were White and a third (34.6%) were Black.

- Two-thirds of the injured patients resided in four Boston zip code areas: Codman Square (34.1%), Fields Corner (13.4%), Mattapan (11.2%), and Uphams Corner (8.4%).

- The median charge for self-inflicted injury discharges was $2,780 as compared to $3,285 for all injury discharges. However, the average daily charge ($722) was similar to all other injury causes ($730).

- The median length of stay was three days in contrast to four days for all injury discharges.

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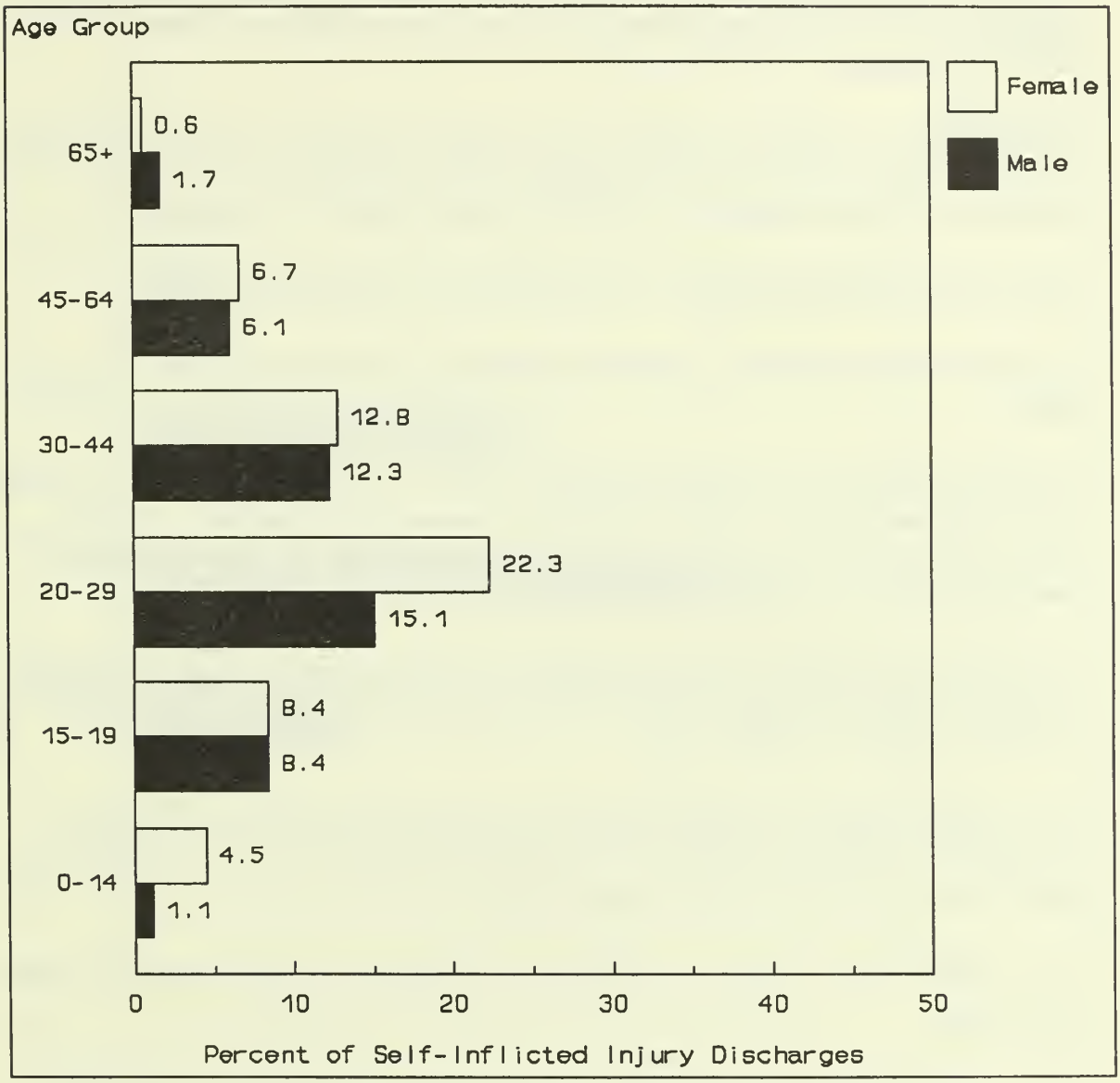
[8] This group of 31 hospitals accounted for most of the discharges with E codes in the Uniform Hospital Discharge Data Set.

- Two of the 21 deaths included in the injury data set occurred among people hospitalized for self-inflicted injuries.

- Most (95.5%) self-inflicted injury discharges had a principal diagnosis of poisoning or toxic effects.

Figure 2
Distribution of Self-inflicted Injury Discharges from Carney Hospital by Age Group and Sex



Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.

Note: Number of self-inflicted injury discharges (total=179, female=99, male=80).

Assault-related Injuries

Assault-related injuries were the third leading cause of injury hospitalization, accounting for 169 admissions during the study period.

- More than ten percent (10.9%) of E-coded injury discharges were the result of assaults. Assaults accounted for 9.2% of nonfatal, E-coded injury discharges in FY 1985 among a selected group of acute care hospitals in Massachusetts.

- More than two-fifths (43.8%) of assault-related injuries involved young adults (20-29); a third (32.0%) were between 30 and 44; and about an eighth (13.6%) were adolescents (15-19) (Figure 3).

- Assault-related injuries accounted for the largest proportion of injury discharges for young adults (23.3%) and the second largest proportion for adolescents (20.0%) and people between 30 and 44 years old (20.1%) (Table 3).

- Males predominated markedly in all age groups under age 65.

- Almost two-thirds (63.3%) of patients admitted for assault-related injuries were Black.

- Two-fifths (39.6%) of the assault-related injuries involved cutting; 16.6% resulted from unarmed fights or brawls; 10.7% were caused by striking with blunt or thrown objects; 10.1% were wounds from firearms; and most of the assault weapons for the remaining injuries (23.1%) were not specified.

- Four-fifths of the injured patients resided in five Boston zip code areas: Codman Square (38.5%), Mattapan (13.6%), Uphams Corner (11.8%), Fields Corner (11.2%), and Grove Hall (5.9%).

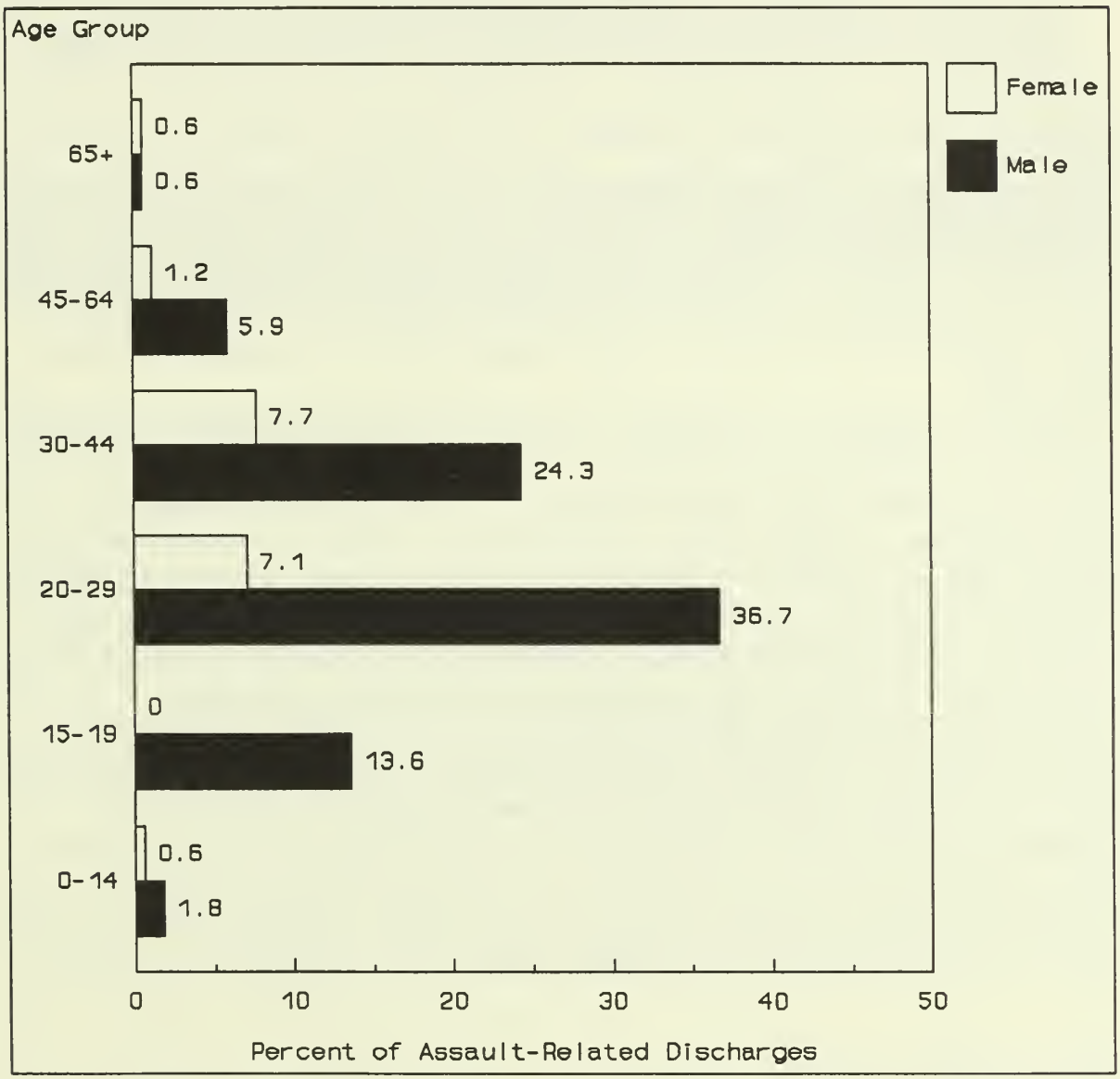
- The median charge for assault-related injuries was $2,140 as compared to $3,285 for all injury discharges. However, the average daily charge ($905) was higher than for all other injury causes ($720).

- The median length of stay was two days as compared to four days for all injury discharges.

- One of the 21 deaths included in the injury data set occurred among people hospitalized for assault-related injuries.

- The most common principal diagnoses were: open wound (45.0%), facial fracture (14.2%), internal injury (10.1%), and upper limb fracture (7.1%).

Figure 3
Distribution of Assault-related Injury Discharges from Carney Hospital by Age Group and Sex



Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.

Note: Number of assault-related injury discharges (total=169, female=29, male=140).

Other Causes of Injury

- Unintentional poisoning was the second leading cause of injury hospitalization for children (17.4%) and the elderly (4.9%). In fact, poisoning was among the five leading causes for all age groups, accounting for 8.5% of E-coded injury discharges (Table 3).

- Motor-vehicle occupant injuries were less frequent than for other populations[9]. This cause was the fourth or fifth leading cause of injury hospitalization for each age group except children, accounting for 5.7% of E-coded injury discharges (Table 3).

Conclusion

This description of injury discharges from Carney Hospital for FY 1987 and FY 1988 was made possible by the coding of the external cause for most of the injuries treated. By analyzing E codes in conjunction with the demographic, clinical, and financial data from hospital discharge records, we have provided a potential basis for targeting specific causes and age groups for injury prevention efforts in the hospital's primary service area.

These data underscore the problem of intentional injuries, both assault-related and self-inflicted, especially among adolescents and young adults. This analysis could help in the design, implementation, and evaluation of community efforts to reduce intentional injuries in specific Boston neighborhoods. A range of measures including drug and alcohol prevention and rehabilitation programs, parenting programs, school improvement programs, violence prevention curricula, and restrictions on the sale, possession, and carrying of firearms, are believed to be promising in reducing assault-related injuries.[10] However, these interventions require further evaluation.

Falls among the elderly, another priority injury in this analysis, could be reduced through the use of home safety devices and education about safety habits offered by senior citizen centers, nursing homes, social service agencies, Visiting Nurse Associations, and a variety of public and private health care providers. Professional staff and volunteers could receive training and materials through the Statewide Comprehensive Injury Prevention Program and the Office of Disability Prevention and through community agencies knowledgeable about injury prevention for the elderly.

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[9] Among a selected group of acute care hospitals in Massachusetts, motor-vehicle occupant injuries were the second leading cause of injury-related hospitalizations, accounting for 10.5% of nonfatal E-coded discharges in FY 1985.

[10] National Committee for Injury Prevention and Control. Injury prevention: meeting the challenge. New York: Oxford University Press, 1989: Am J Prev Med, Suppl: 5(3): 207-210.

The effectiveness of the injury prevention activities then could be assessed by examining hospital discharge data in the following years as well as other types of data.

In conclusion, "the universal use of E codes in hospital discharge data is one of the most important goals for the injury prevention community. Consistent use of E codes would provide an extremely valuable resource for the study of injury rates and patterns. Injury control practitioners would be able to use this information to obtain a much more accurate view of a local injury problem. It would also allow much more thorough aggregation of injury morbidity data as well as comparisons of the data at the local, state, and national levels and among specialized studies."[11] Other benefits of improved injury data include: documentation of known problems, (e.g., near-drownings), identification of new hazards, (e.g., all-terrain vehicles), evaluation of the effectiveness of prevention strategies, (e.g., reduction of poisonings due to childproof packaging), determination of the cost of various causes of nonfatal injuries to be better able to focus scarce resources to obtain the greatest benefit, formulation of local and state goals and objectives based on empirical findings, improvement in diagnosing and treating injured patients, and hospital marketing activities.

[11] Ibid. p.45.

Table 3
Leading Causes of Injury Discharges from Carney Hospital by Age Group and Sex

Cause: Total	#	%	Cause: Female	#	%	Cause: Male	#	%
0-14:								
Falls	84	44.2	Falls	24	39.3	Falls	60	46.5
Poisoning	33	17.4	Poisoning	11	18.0	Poisoning	22	17.1
Pedal cycle	16	8.4	Self-inflicted	8	13.1	Pedal cycle	11	8.5
MV/pedestrian	13	6.8	Pedal cycle	5	8.2	MV/pedestrian	9	7.0
Self-inflicted	10	5.3	MV/pedestrian	4	6.6	MV occupant	6	4.7
All other causes	34	17.9		9	14.8		21	16.3
All causes	**190**	**100.0**		**61**	**100.0**		**129**	**100.0**
15-19:								
Self-inflicted	30	26.1	Self-inflicted	15	48.4	Assault-related	23	27.4
Assault-related	23	20.0	Poisoning	6	19.4	Self-inflicted	15	17.9
Falls	15	13.0	Falls	4	12.9	Falls	11	13.1
Poisoning	11	9.6	MV occupant	3	9.7	MV occupant	6	7.1
MV occupant	9	7.8				Poisoning	5	6.0
All other causes	27	23.5		3	9.7		24	28.6
All causes	**115**	**100.0**		**31**	**100.0**		**84**	**100.0**

(Continued)

Table 3
Leading Causes of Injury Discharges from Carney Hospital by Age Group and Sex (Continued)

Cause: Total	#	%	Cause: Female	#	%	Cause: Male	#	%
20-29								
Assault-related	74	23.3	Self-inflicted	40	37.8	Assault-related	62	29.2
Self-inflicted	67	21.1	Falls	14	13.2	Self-inflicted	27	12.7
Falls	39	12.3	Assault-related	12	11.3	Falls	25	11.8
MV occupant	24	7.5	MV occupant	10	9.4	MV occupant	14	6.6
Poisoning	24	7.5	Poisoning	10	9.4	Poisoning	14	6.6
All other causes	90	28.3		20	18.9		70	33.0
All causes	**318**	**100.0**		**106**	**100.0**		**212**	**100.0**
30-44:								
Falls	54	20.1	Falls	25	23.8	Assault-related	41	25.0
Assault-related	54	20.1	Self-inflicted	23	21.9	Falls	29	17.7
Self-inflicted	45	16.7	Assault-related	13	12.4	Self-inflicted	22	13.4
Poisoning	24	8.9	MV occupant	9	8.6	Poisoning	18	11.0
MV occupant	23	8.6	Overexertion	8	7.6	MV occupant	14	8.5
All other causes	69	25.7		27	25.7		40	24.4
All causes	**269**	**100.0**		**105**	**100.0**		**164**	**100.0**

(Continued)

Table 3
Leading Causes of Injury Discharges from Carney Hospital by Age Group and Sex (Continued)

Cause: Total	#	%	Cause: Female	#	%	Cause: Male	#	%
45-64:								
Falls	90	44.3	Falls	57	52.8	Falls	33	34.7
Self-inflicted	23	11.3	Self-inflicted	12	11.1	Self-inflicted	11	11.6
Poisoning	17	8.4	Poisoning	9	8.3	Assault-related	10	10.5
MV occupant	13	6.4	MV occupant	9	8.3	Poisoning	8	8.4
Assault-related	12	5.9	Adverse drug	5	4.6	MV/pedestrian	5	5.3
All other causes	48	23.6		16	14.8		28	29.5
All causes	**203**	**100.0**		**108**	**100.0**		**95**	**100.0**
65+:								
Falls	354	78.1	Falls	269	83.0	Falls	85	65.9
Poisoning	22	4.9	Poisoning	12	3.7	Poisoning	10	7.8
Environmental	13	2.9	Environmental	6	1.9	Environmental	7	5.4
MV occupant	11	2.4	MV occupant	6	1.9	MV occupant	5	3.9
Adverse drug	11	2.4	Adverse drug	6	1.9	Adverse drug	5	3.9
All other causes	42	9.3		25	7.7		17	13.2
All causes	**453**	**100.0**		**324**	**100.0**		**129**	**100.0**

Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.
Note: Percents do not always total 100.0 due to rounding.

Appendix A

ICD-9-CM External Cause of Injury Categories

Motor Vehicle-Occupant	
E810.0, E810.1, E811.0, E811.1, E812.0, E812.1, E813.0, E813.1, E814.0, E814.1, E815.0, E815.1, E816.0, E816.1, E817.0, E817.1, E818.0, E818.1, E819.0, E819.1, E822.0, E822.1, E823.0, E823.1, E824.0, E824.1, E825.0, E825.1,	Operator or passenger in motor vehicle Includes: Collision and noncollision traffic and nontraffic accidents; driver or passenger of car, bus, truck, van, or construction machinery in transport under its own power; off-road motor vehicle operating on a public highway Excludes: Occupant or passenger of bicycle, motorcycle, off-road vehicle not on highway, motorized bicycles; pedestrians
Motor Vehicle - Pedal Cycle Rider	
E810.6, E811.6, E812.6, E813.6, E814.6, E815.6, E816.6, E817.6, E818.6, E819.6, E822.6, E823.6, E824.6, E825.6	Any person riding on a pedal cycle involved in a collision or noncollision accident with a motor vehicle on a public highway Includes: Accidents on and off public highways, e.g., parking lots, driveways
Motor Vehicle - Pedestrian	
E810.7, E811.7, E812.7, E813.7, E814.7, E815.7, E816.7, E817.7, E818.7, E819.7, E822.7, E823.7, E824.7, E825.7	Pedestrian injured in any collision or noncollision traffic or nontraffic accident involving a motor vehicle
Motorcyclist	
E810.2, E810.3, E811.2, E811.3, E812.2, E812.3, E813.2, E813.3, E814.2, E814.3, E815.2, E815.3, E816.2, E816.3, E817.2, E817.3, E818.2, E818.3, E819.2, E819.3, E822.2, E822.3, E823.2, E823.3, E824.2, E824.3, E825.2, E825.3	Operator or passenger on motorcycle involved in collision or noncollision traffic or nontraffic accident involving a motor vehicle Includes: Motorized bicycle (moped, scooter, tricycle); occupant of side car

Nonmotor Vehicle Pedal Cycle
E826.0-E826.9

Any person injured in a nonmotor vehicle accident involving a pedal cycle

Includes: Fall from bicycle; bicycle colliding with pedestrian, other bicycle, animal, object, or other road vehicle, e.g., streetcar

Excludes: Accidents involving motor vehicles, railroad trains, and aircraft

Off-Road Motor Vehicle
E820.0-E820.9, E821.0-E821.9

Nontraffic accidents involving motor vehicles designed to negotiate rough or soft terrain or snow

Includes: All-terrain vehicles (ATVs) and snowmobiles

Other Transport Accidents
E800.0-E807.9,
E810.4, E810.5, E810.8, E810.9,
E811.4, E811.5, E811.8, E811.9,
E812.4, E812.5, E812.8, E812.9,
E813.4, E813.5, E813.8, E813.9,
E814.4, E814.5, E814.8, E814.9,
E815.4, E815.5, E815.8, E815.9,
E816.4, E816.5, E816.8, E816.9,
E817.4, E817.5, E817.8, E817.9,
E818.4, E814.5, E818.8, E818.9,
E819.4, E819.5, E819.8, E819.9,
E822.4, E822.5, E822.8, E822.9,
E823.4, E823.5, E823.8, E823.9,
E824.4, E824.5, E824.8, E824.9,
E825.4, E825.5, E825.8, E825.9,
E827.0-E829.9, E831.0-E831.9,
E833.0-E838.9, E840.0-E845.9,
E846-E848

All other transport accidents

Includes: Motor vehicle traffic accidents involving other and unspecified person; any motor vehicle nontraffic accident involving any person; occupants of streetcars and animal riders; all railway accidents except those with motor vehicles; any person involved in any air or water transport vehicle accident; animal rider or rider of animal-drawn vehicle; motor vehicle nontraffic accident while boarding or alighting

SEE NOTE 1 (page 23)

Misadventure
E870.0-E876.9

Misadventures to patients during surgical and medical care
Excludes: Accidental overdose of drugs

Postoperative Complications
E878.0-E879.9

Surgical and medical procedures as the cause of abnormal reaction without mention of misadventure at the time of the procedure

Includes: Organ rejection, malfunction of devices, postoperative renal failure or intestinal obstruction

Excludes: Adverse reactions to anesthesia without mention of misadventure; infusion and transfusion reactions without mention of misadventure

Falls
E880.0-E886.9, E887, E888

Includes: Falls on same level (slipping, tripping); falls on different levels (stairs, bed, ladder); diving into swimming pool; tackles in sports

Excludes: Falls from horses in sports or transport; falls from burning buildings; falls from moving vehicles and bicycles; falls while boarding or leaving vehicles; falls onto sharp objects; falls into water

SEE NOTE 2 (page 23)

Environmental/Radiation
E900.0-E909, E926.0-E926.9, E928.0-E928.8

Accidents due to natural and environmental factors

Includes: Excessive heat, cold, air pressure changes, travel and motion, hunger, thirst, exposure, neglect, venomous animals and plants, unspecified environmental, exposure to radiation

Excludes: Ingestion of poisonous animalsorplants; plant puncture wounds, animal bites; road vehicle accidents involving animals

Drowning and Submersion (Accidental)
E830.0-E830.9, E832.0-E832.9, E910.0-E910.9

Includes: Accidental drowing and submersion, swimmer's cramp, water sports, any falls or accidents involving watercraft

Excludes: Transport accidents other than watercraft; injuries due to diving into swimming pool and striking side or bottom; drowning as a result of a motor vehicle accident

Fire, Flames and Hot Substances (Burns and Scalds)
E890.0-E899, E924.0-E924.9

Accidents caused by fire and flames; scalds; hot substances; objects; steam

Includes: Accidental burning by fire, secondary fires due to explosion; asphyxia due to fire; smoke and fumes due to fire; fall or jump from burning structure; ignition of clothing or bedclothes

Excludes: Fire in machinery in operation; transport vehicle except stationary; fire in other vehicle, e.g., ski lift; watercraft fires; intentional fires; electric current; radiation burns; internal burns

Poisonings (Accidental)
E850.0-E869.9

Accidental poisonings by drugs, medicinals, and biological substances

Includes: Solids, liquids, gases and vapors

Excludes:
1. administration with suicidal or homicidal intent or with intent not determined as accidental or purposeful
2. adverse reactions to correct drugs properly administered
3. food poisoning (bacterial)
4. poisoning and toxic reactions to plants
5. carbon monoxide poisoning from motor vehicle, watercraft, or aircraft in transit
6. carbon monoxide poisoning from smoke and fumes in fire

Suffocations (Accidental)
E911, E912, E913.0-E913.9

Inhalation and ingestion of food or object causing obstruction of respiratory passage or suffocation; accidental mechanical suffocation

Includes: Smothering, choking

Excludes: Intentional suffocations and those not determined as accidental or purposeful; any ingestion of a foreign body without mention of asphyxia or obstruction of respiratory passage

Foreign Body
E914-E915

Foreign body in the eye, adnexa, or other orifice

Includes: Injury to respiratory tract without obstruction or asphyxia

Excludes: Corrosive liquids in eye

Struck by Object
E916, E917.0-E917.9, E918

Struck by falling object, striking against or struck by persons or objects, caught accidentally between objects

Excludes: Striking against object or persons with fall; accident involving machinery or motor vehicle in operation; assault; cutting or piercing instrument; accident resulting in drowning or submersion

Machinery in Operation
E919.0-E919.9

Accident caused by machinery in operation

Cutting/Piercing
E920.0-E920.9

Accident caused by cutting or piercing instrument or object

Includes: Fall on sharp object; accident caused by powered or nonpowered hand tools or appliances

Explosion/Firearms (Accidental)
E921.0-E921.9, E922.0-E922.9, E923.0-E923.9

Accident caused by firearms, explosion of pressure vessel or explosive material; fireworks

Excludes: intentional firearms and those not determined as accidental or purposeful; explosions due to or causing fire, machine explosions, explosions in transport vehicles or machinery in operation; air rifles and BB guns

SEE NOTE 3 (page 23)

Electricity
E925.0-E925.9

Accident caused by electrical currents

Overexertion
E927

Overexertion and strenuous movements from excessive physical exercise, recreation, lifting, pulling, pushing

Unspecified
E928.9

Accident unspecified

Late Effects
E929.0-E929.9, E959, E969, E977, E989, E999

Late effects of accidents, assaults, injury undetermined as accidental or purposeful, legal intervention, suicide, war operations

Adverse Drug Reaction
E930.0-E949.9

Drugs, medicinal and biological substances causing adverse effects in therapeutic use

Includes: Correct drug properly administered in therapeutic or prophylactic dosage as the cause of any adverse effect

Suicide and Self-Inflicted
E950.0-E953.9, E954, E955.0-E955.9, E956, E957.0-E958.9

Suicide and self-inflicted injuries

Includes: Suicide, attempted suicide, and intentional self-inflicted injuries

Homicide and Purposely Inflicted by Other

E960.0-E962.9, E963-E964, E965.0-E965.9, E966, E967.0-E968.9

Injuries inflicted by another person with intent to injure or kill, by any means

Includes: Child battering, rape

Legal Intervention

E970-E976, E978

Injuries inflicted by the police or other law enforcement agents on duty; includes legal execution by any method

Undetermined Intent

E980.0-E988.9

Injury undetermined whether accidentally or purposely inflicted

Includes: Self-inflicted injuries but not poisoning by corrosive and caustic substances

Wars

E990.0-E998

Injuries resulting from operations of war

Includes: Injuries to military personnel and civilians caused by and occurring during war and civil insurrections

Excludes: Training accidents

NOTES:

1. E-code entries in the E810-E819 and E822-E825 ranges that end in .8 and .9 refer to "other" and "unspecified" injury victims, respectively. Often, these are injuries to motor vehicle occupants, and some researchers classify them as such. We have elected not to do so because of the possible introduction of bias into the data. This practice will overestimate the importance of occupant injury, and underestimate the problem of pedestrian, bicycle and motorcycle injuries.

2. Fracture, cause unspecified (E887), has been included as a fall although it could have a different cause.

3. **Firearms** may be of special interest and appear in several categories. If examining firearms as a separate category, the grouping would be as follows:

   E922.0-E922.9, E955.0-E955.4, E965.0-E965.4, E970, E985.0-E985.4, E991.2

   Accidental; self-inflicted; assault; legal intervention and war operations; undetermined if accidental or purposeful

   Includes: Firearm injury due to legal intervention and war operations

   Excludes: Air rifles, BB guns

Appendix B
ICD-9-CM Nature of Injury Diagnostic Categories

Diagnostic Category	Codes
Skull Fracture	800-801.99, 803-804.99
Concussion	850-850.99
Facial Fracture	802-802.5, 802.8-802.9
Intracranial Non-Fracture	851-854.19
Neck Trunk Fracture	805-805.98, 807-809.1
Vertebral Fracture with SCI*	806-806.9
Upper Limb Fracture	810-819.1
Femur Fracture	820-821.39
Lower Limb Fracture	822-829.1
Dislocations	830-839.9
Sprains and Strains	840-848.9
Internal Injuries	860-869.1
Eye Injuries	802.6-802.7, 870-871.9, 900.03,918.0-918.9, 921.0- 921.9, 930.0-930.9, 940.0-940.9, 941.02, 941.12, 941.22, 941.32, 941.42, 941.52, 950-950.9, 951.0- 951.1, 951.3
Open Wounds	872-884.2, 890-894.2
Traumatic Amputation	885-887.7, 895-897.7
Blood Vessel Injury	900-900.02, 900.1-904.9
Superficial Injury	910-917.9, 919-919.9
Contusions	920, 922-924.9
Crushing	925-929.9
Foreign Body in Orifice	931-939.9
Burns	941-941.01, 941.03-941.11, 941.13-941.21, 941.23-941.31, 941.33-941.41, 941.43-941.51, 941.53-949.5
Nerve Injury	951.2, 951.4-957.9
Poisoning and Toxic Effects	960-989.9
Late Effects	905-909.9
Traumatic Complications/Unspecified	958-959.9
Complications of Care	996-999.9
Other and Unspecified	990-995.9

* Spinal Cord Injury